

FORM PTO-1390 TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE ATTORNEY'S DOCKET NUMBER 4197-103
INTERNATIONAL APPLICATION NO. PCT/DE99/02976		INTERNATIONAL FILING DATE 14 September 1999
U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 09/787310		
PRIORITY DATE CLAIMED 17 September 1998		
TITLE OF INVENTION METHOD FOR PRODUCING CELLULOSIC FORMS		
APPLICANT(S) FOR DO/EO/US Holger Gunkel and Micheal Mooz		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</p> <p>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ul style="list-style-type: none"> a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). </p> <p>6. <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</p> <p>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ul style="list-style-type: none"> a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. </p> <p>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).*(Unsigned)</p> <p>10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p>		
Items 11. to 16. below concern other document(s) or information included:		
<p>11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>14. <input type="checkbox"/> A substitute specification.</p> <p>15. <input type="checkbox"/> A small entity statement.</p> <p>16. <input type="checkbox"/> Other items or information:</p>		

NOTE: This application is being filed without an Oath or Declaration under the provisions of 37 CFR § 1.53 in order that applicants may secure a filing date of March 14, 2001. Upon receipt of a "Notice to File Missing Parts - Filing Date Granted," a Declaration and Power of Attorney, and an Assignment in favor of applicants' assignees, Alceru Schwarza GmbH will be filed in the Patent and Trademark Office. The undersigned agent affirmatively states that he has been duly authorized and appointed to file this application on behalf of the applicants and applicants' assignees, and that the Declaration and Power of Attorney to be filed hereafter will confirm the undersigned agent's authorization and appointment. Alceru Schwarza GmbH is a small business entity within the meaning of 37 CFR § 1.9.

09/787310
JC03 Rec'd PCT/PTO 14 MAR 2001

17. <input checked="" type="checkbox"/> The following fees are submitted: Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO \$860.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) \$0.00 No International preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) \$0.00 Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$1000.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) \$0.00				CALCULATIONS	PTO USE ONLY																				
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$ 860.00																					
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 2px;">Claims</th> <th style="text-align: left; padding: 2px;">Number Filed</th> <th style="text-align: left; padding: 2px;">Number Extra</th> <th style="text-align: left; padding: 2px;">Rate</th> <th style="text-align: left; padding: 2px;"></th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">Total Claims</td> <td style="padding: 2px;">-20 =</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">X \$18.00</td> <td style="text-align: left; padding: 2px;">\$</td> </tr> <tr> <td style="padding: 2px;">Independent Claims</td> <td style="padding: 2px;">- 3 =</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">X \$80.00</td> <td style="text-align: left; padding: 2px;">\$</td> </tr> <tr> <td colspan="3" style="padding: 2px;">Multiple dependent claim(s) (if applicable)</td> <td style="padding: 2px;">+ \$270.00</td> <td style="text-align: left; padding: 2px;">\$</td> </tr> </tbody> </table>				Claims	Number Filed	Number Extra	Rate		Total Claims	-20 =	0	X \$18.00	\$	Independent Claims	- 3 =	0	X \$80.00	\$	Multiple dependent claim(s) (if applicable)			+ \$270.00	\$	860.00	
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Total Claims	-20 =	0	X \$18.00	\$																					
Independent Claims	- 3 =	0	X \$80.00	\$																					
Multiple dependent claim(s) (if applicable)			+ \$270.00	\$																					
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				\$ 430.00																					
SUBTOTAL =				\$ 430.00																					
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +				\$																					
TOTAL NATIONAL FEE =				\$ 430.00																					
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$																					
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a. <input checked="" type="checkbox"/> A check in the amount of <u>\$430.00</u> to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>08-3284</u> . A duplicate copy of this sheet is enclosed.																									
<p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not yet been met, a petition to revive (37 CFR 1.127(a) or (b)) must be filed and granted to restore the application to pending status.</p>																									
<p>SEND ALL CORRESPONDENCE TO:</p> <p>Steven J. Hultquist Intellectual Property/Technology Law P. O. Box 14329 Research Triangle Park, NC 27709</p>																									
 MARIANNE FUERER Registration No. 39,983																									



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4197-103

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Holger Gunkel et al.

Application No.: New U.S. National Stage Application of
PCT International Application No. PCT/DE99/02976

International Filing Date: 14 September 1999

Priority Date Claimed: 17 September 1998 (German Appl. No. 198 42 556.2)

U.S. National Phase Filing Date: Date of mailing identified below

Title: **METHOD FOR PRODUCING CELLULOSIC FORMS**

EXPRESS MAIL CERTIFICATE

I hereby certify that I am mailing the attached documents to the
Commissioner for Patents on the date specified, in an envelope
addressed to the Commissioner for Patents, Washington, DC 20231,
and Express Mailed under the provisions of 37 CFR 1.10.

Blake Crouch

Name of Person Mailing This Document

Blake Crouch

Signature

March 14, 2001

Date

EL647805461 US

Express Mail Label Number

**SUBMISSION UNDER 35 U.S.C. §371 OF UNITED STATES PATENT
APPLICATION (NATIONAL PHASE PROCEEDINGS) BASED ON
INTERNATIONAL APPLICATION NO. PCT/DE99/02976 AND CLAIMING
PRIORITY OF GERMAN PATENT APPLICATION NO. 198 42 556.2**

Commissioner for Patents
Box PATENT APPLICATION
Washington, DC 20231

Sir:

Submitted herewith for filing under the provisions of 37 CFR 1.53 and 35 U.S.C. § 371 is the above-referenced patent application, based on International Patent Application No. PCT/DE99/02976 and

claiming priority of German Patent Application No. 198 42 556.2. An English translation is included having 6 pages of specification, 2 pages of claims, 1 page of Abstract and 1 drawing sheet. Also included is a Preliminary Amendment, unsigned Declaration and Power of Attorney, a check in the amount of \$430.00, a copy of the PCT International Application and documents as originally filed and a transmittal letter.

Please direct correspondence relating to this application to Steven J. Hultquist, Intellectual Property Technology Law, P.O. Box 14329, Research Triangle Park, NC 27709, and direct telephonic communications relating to this application to Steven J. Hultquist at (919) 419-9350.

Respectfully submitted,



Marianne Fuierer
Registration No. 39,983
Attorney for Applicants

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4197-103
PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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EXPRESS MAIL CERTIFICATE

I hereby certify that I am mailing the attached documents to the
Commissioner for Patents on the date specified, in an envelope
addressed to the Commissioner for Patents, Washington, DC
20231, and Express Mailed under the provisions of 37 CFR
1.10.

Blake Crouch

Name of Person Mailing This Document

Blake Crouch

Signature

March 14, 2001

Date

EL647805461US

Express Mail Label Number

PRELIMINARY AMENDMENT

Commissioner for Patents
BOX PATENT APPLICATION
Washington, D.C. 20231

Sir:

Prior to examination of the above-identified new national phase patent application, please amend the application, as follows:

In the Specification

On page one (1) of the specification please delete "Process for producing formed cellulosic articles"

In the Claims

Amend claims 1-8, as follows:

1. A process [Process] for producing formed cellulosic articles, such as fibres, filaments, sheetings, membranes or tubes, comprising
 - a) extruding a solution of cellulose in an aqueous amine oxide, particularly N-methylmorpholine N-oxide, through an extrusion die via an air gap and coagulating the formed article in an aqueous precipitation bath containing amine oxide, and
 - b) passing the formed article through at least one washing stage for removing residual amine oxide,
characterized in that the liquor of the precipitation bath in the precipitation stage and/or the washing liquor of the washing stage(s) is treated with ultra-violet radiation.
2. The process [Process] according to claim 1 wherein the [characterized in that an] ultra-violet radiation has [having] a wave length in the range from 200 to 280 nm [is used].
3. The process [Process] according to claim 2 wherein [characterized in that] the ultra-violet radiation has a wave length of 254 nm.
4. The process [Process] according to claim 2 wherein [any of the claims 1 to 3 characterized in that] the ultra-violet radiation is generated by a mercury low-pressure lamp.

- 3
5. The process [Process] according to claim 2 wherein [any of the claims 1 to 4 characterized in that] the UV treatment is limited to the liquors of the washing stage(s) having a temperature below 50⁰C.
 6. The process [Process] according to claim 1 wherein [any of the claims 1 to 5 characterized in that] precipitation bath liquors or washing liquors having a Hazen color number Hz ≤ 400 is subjected to the UV treatment.
 7. The process [Process] according to claim 1 wherein [any of the claims 1 to 6 in which] the precipitation bath and several washing stages are connected in series and have liquor cycles of their own, characterized in that the cycle liquors of the precipitation bath and the first washing stage(s) are treated with ultra-violet radiation.
 8. The process [Process] according to claim 6 characterized in that the cycle liquors are irradiated with a power in the range from 0.1 to 1.0 Wh/l.

Please add the following claims 9-15:

9. A system for reducing unwanted microorganisms in liquors containing amine oxide, comprising:
 - a precipitation bath; and
 - a series of washing stages communicatively connected to each other and the precipitation bath wherein the precipitation bath and at least one of the washing stages comprise a UV radiation source positioned for irradiating the washing liquor therein with ultra-violet radiation to reduce unwanted microorganisms in the washing liquor.
10. The system according to claim 9 wherein the ultra-violet radiation has a wave length in the range from 200 to 280 nm.
11. The system according to claim 9 wherein the ultra-violet radiation has a wave length of 254 nm.
12. The system according to claim 9 wherein the ultra-violet radiation is generated by a mercury low-pressure lamp.

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13. The system according to claim 9 wherein the irradiation treatment is limited to the liquors of the washing stage(s) having a temperature below 50⁰C.
 14. The system according to claim 9 wherein liquors in the precipitation and/or washing stages having a Hazen color number Hz ≤ 400 is subjected to the UV treatment.
 15. A method for reducing unwanted microorganisms in washing liquors containing amine oxide, comprising:
irradiating washing liquor containing a N-methylmorpholine N-oxide in at least one washing stage with ultra-violet radiation in a sufficient amount to effectively reduce unwanted microorganisms therein, the ultra-violet radiation having a wave length in the range from 200 to 280 nm.

REMARKS

A replacement page for page 1 and a set of claims amended to date are included herewith in Appendix .A and B respectively.

It is requested that the examination and prosecution of this application proceed on the basis of the English translation of the PCT International application included herewith and these amended claims 1-15.

Respectfully submitted,


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Attorney for Applicants

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09/78731Q
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APPENDIX A

1. A process for producing formed cellulosic articles, such as fibres, filaments, sheetings, membranes or tubes, comprising

a) extruding a solution of cellulose in an aqueous amine oxide, particularly N-methylmorpholine N-oxide, through an extrusion die via an air gap and coagulating the formed article in an aqueous precipitation bath containing amine oxide, and

b) passing the formed article through at least one washing stage for removing residual amine oxide,

characterized in that the liquor of the precipitation bath in the precipitation stage and/or the washing liquor of the washing stage(s) is treated with ultra-violet radiation.

2. The process according to claim 1 wherein the ultra-violet radiation has a wave length in the range from 200 to 280 nm.

3. The process according to claim 2 wherein the ultra-violet radiation has a wave length of 254 nm.

4. The process according to claim 2 wherein the ultra-violet radiation is generated by a mercury low-pressure lamp.

5. The process according to claim 2 wherein the UV treatment is limited to the liquors of the washing stage(s) having a temperature below 50°C.

6. The process according to claim 1 wherein precipitation bath liquors or washing liquors having a Hazen color number Hz ≤ 400 is subjected to the UV treatment.

7. The process according to claim 1 wherein the precipitation bath and several washing stages are connected in series and have liquor cycles of their own, characterized in that the cycle

liquors of the precipitation bath and the first washing stage(s) are treated with ultra-violet radiation.

8. The process according to claim 6 characterized in that the cycle liquors are irradiated with a power in the range from 0.1 to 1.0 Wh/l.
9. A system for reducing unwanted microorganisms in liquors containing amine oxide, comprising:
 - a precipitation bath; and
 - a series of washing stages communicatively connected to each other and the precipitation bath wherein the precipitation bath and at least one of the washing stages comprise a UV radiation source positioned for irradiating the washing liquor therein with ultra-violet radiation to reduce unwanted microorganisms in the washing liquor.
10. The system according to claim 9 wherein the ultra-violet radiation has a wave length in the range from 200 to 280 nm.
11. The system according to claim 9 wherein the ultra-violet radiation has a wave length of 254 nm.
12. The system according to claim 9 wherein the ultra-violet radiation is generated by a mercury low-pressure lamp.
13. The system according to claim 9 wherein the irradiation treatment is limited to the liquors of the washing stage(s) having a temperature below 50⁰C.
14. The system according to claim 9 wherein liquors in the precipitation and/or washing stages having a Hazen color number Hz ≤ 400 is subjected to the UV treatment.
15. A method for reducing unwanted microorganisms in washing liquors containing amine oxide, comprising:

irradiating washing liquor containing a N-methylmorpholine N-oxide in at least one washing stage with ultra-violet radiation in a sufficient amount to effectively reduce unwanted microorganisms therein, the ultra-violet radiation having a wave length in the range from 200 to 280 nm.

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APPENDIX B

The invention relates to a process for producing formed cellulosic articles, such as fibres, filaments, sheetings, membranes or tubes, comprising a) extruding a solution of cellulose in an aqueous amine oxide, particularly N-methylmorpholine N-oxide, through an extrusion die via an air gap and coagulating the formed article in an aqueous precipitation bath containing amine oxide, and b) passing the formed article through at least one washing stage for removing residual amine oxide.

While the precipitation bath usually has concentrations of N-methylmorpholine N-oxide (NMMO) from 10 to 25 % by mass and temperatures from 0 to 20°C, in the subsequent washing stages the NMMO content of the washing liquors is decreased to nearly 0 % at temperatures up to 80°C. It is known that these NMMO-containing liquors are characterized by a partially very strong growth of microorganisms. These biological substances are substantially bacteria and fungi and cause considerable difficulties with the processing by the formation of slime aggregates and biofilms. The function of parts of the production plant can be impaired by clogging of pipes, filters, pumps etc. up to their total breakdown. A mechanical cleaning of the washing and precipitation bath systems is very expensive due to the marked adhesion of the polymeric slime substances to all the surfaces and results in unwanted interruptions of the production process.

From WO 96/18761 a process is known in which the biological substances in the baths are degraded by using usual oxidants, such as e.g. hydrogen peroxide, peracetic acid, ozone or chlorine

Process for producing
formed cellulosic articles

The invention relates to a process for producing formed cellulosic articles, such as fibres, filaments, sheetings, membranes or tubes, comprising a) extruding a solution of cellulose in an aqueous amine oxide, particularly N-methylmorpholine N-oxide, through an extrusion die via an air gap and coagulating the formed article in an aqueous precipitation bath containing amine oxide, and b) passing the formed article through at least one washing stage for removing residual amine oxide.

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From WO 96/18761 a process is known in which the biological substances in the baths are degraded by using usual oxidants, such as e.g. hydrogen peroxide, peracetic acid, ozone or chlorine

dioxide. With this method it must be assured by an expensive mechanism that these oxidants are completely disposed before recycling the NMMO into the dope production stage.

According to the process specified in WO 97/07137 a microbicidal agent is added during or after the regeneration of solutions containing amine oxide in order to avoid formation of films in the apparatus. In this case likewise the disadvantage exists that the added substance or its degradation products are concentrated in the NMMO cycle of the process and cause unwanted effects in the individual process steps. The consequences for the thermal stability of the NMMO and the accompanied safety risk must be particularly critically considered.

From WO 97/07108 and WO 97/07138 the UV treatment of amine oxide containing solutions is known with the aim to destroy the N-nitrosomorpholine formed during or after the oxidation of N-methylmorpholine (NMM) to NMMO. The UV treatment is restricted to the regeneration of the precipitation bath for the purpose of reusing the regenerated NMMO for preparing the dope.

It is the object of the invention to avoid the formation and growth of the coatings, films and slime aggregates formed by microorganisms in the parts of the plant having contact with the NMMO containing liquors and the impairment and operating troubles caused thereby. Particularly the above-mentioned process should not require frequent cleaning of the plant even in a continuous operation. Furthermore, it should be refrained from using chemical substances in order to avoid the problems of their monitoring and, if required, their re-separation accompanied therewith. Further advantages can be gathered from the following specification.

With the process specified at the beginning, according to the invention these objects are achieved in that the liquor of the precipitation bath in the precipitation stage and/or the washing liquor of the washing stage(s) is treated by ultra-violet radiation. Surprisingly it has been found that the microorganisms developing in liquors containing amine oxide, particularly NMMO, which microorganisms result in the unwanted deposits, are deactivated by the UV radiation or their DNS (deoxyribonucleic acid) is killed by a UV induced reaction. As a result the total germ number in the liquor is maintained low, and possible cleanings of the plant are only necessary after substantially longer operating periods.

According to the preferred embodiment of the process of the invention a ultra-violet radiation of a wave length in the range from 200 to 280 nm is used. Especially the used UV radiation has a wave length of 254 nm. Conveniently this radiation is generated by a mercury low-pressure lamp the maximum intensity of which is at this wave length.

Preferably the UV treatment of the liquors of the washing stage(s) is limited to a temperature below 50°C. When operating with several washing steps in series the temperature of the washing liquor of the last steps is often elevated above 50°C in order to support washing the amine oxide out of the formed articles. In these stages the UV radiation treatment can be omitted because the microorganisms cannot develop at these temperatures. On the other hand the growth of the microorganisms is strongly inhibited at temperatures below 20°C. As the precipitation baths are frequently maintained below this temperature the radiation can then be markedly reduced. As far as it is possible in the subsequent washing stages to avoid temperatures between 20 and 40°C, the radiation power can be reduced also in those stages.

Preferably the precipitation bath liquors or the washing liquors having a Hazen Color Number $H_z \leq 400$ are subjected to the UV treatment. It has been found that more intense colorings of the liquors reduce the efficiency of the UV treatment and require higher radiation powers. The effectivity of the UV treatment is ensured up to said Hazen Color Number. Consequently, suppressing the formation of colored side products is also advantageous with the UV treatment of the precipitation bath and washing liquors according to the invention aside from other reasons.

If with the process of the invention the precipitation bath and several washing stages are connected in series and comprise liquor cycles of their own, the cycle liquors of the precipitation bath and the first washing stage(s) are treated with UV radiation because these liquors offer comparatively favorable conditions (temperature, content of organic substances) for the development of microorganisms. As the liquor from the last washing stage is passed to the precipitation bath opposite to the movement of the fibres, it is repeatedly exposed to the UV radiation on this path. The UV radiation in a cycle can be carried out continuously or intermittently. It is possible to integrate the UV radiators in a simple manner also in already existing plants.

Preferably the cycle liquors are irradiated with a power in the range from 0.1 to 1.0 Wh/l, especially with 0.5 Wh/l. The conditions for the microbiological growth and the effectiveness of its combat by UV radiation are very different depending on the pH value, temperature, concentration of NMMO, oxygen introduction and light transmission (color number). The respective specific conditions can be taken into account by adapting the power and duration of the UV irradiation.

The figure shows a diagrammatic representation of a plant for carrying out the process of the invention with a precipitation

bath and a connected five-stage washing part.

The precipitation bath has an internal cycle for the bath liquor from the catch vat 1^b to the spinning vessel 1^a with a pump 1^c, a cooler 1^d and a UV radiator 1^e. Spent precipitation bath is withdrawn via line 1^f and passed to a cleaning stage 2. The cleaned precipitation bath is concentrated in the stage 3. The formed NMMO concentrate is used in the stage 4 for preparing the dope which is pumped to the spinnerets. The distillate formed in the stage 3 is fed as washing liquor to the last washing stage 9.

The first washing stage 5 has an external washing liquor cycle 5^a with an UV radiator 5^e. NMMO-containing washing liquor is passed from the cycle 5^a via a line 5^b to the catch vat 1^b. The second washing stage 6 is provided with an UV radiator 6^e in the same manner as the first washing stage 5. The further washing stages 7,8 and 9 have likewise external washing agent cycles 7^a, 8^a and 9^a, respectively, which differ from the cycles 5^a and 6^a in that no UV radiator is arranged in them because the temperatures of the washing agent is here maintained above 50°C. The path of the extruded products through the plant is shown by a dashed line.

Practical Example

In the plant shown in the figure the UV radiators are operated with a power of 0.5 Wh/l circulated liquor. The total germ number was determined in intervals of 2 days with samples from the precipitation bath by means of cultures (TTC Agar). The total germ number was continuously below 10^5 /ml. A cleaning was only necessary after 2 months.

Comparative Example

With the same procedure as in the practical example, however without the UV irradiation, an increase of the total germ number

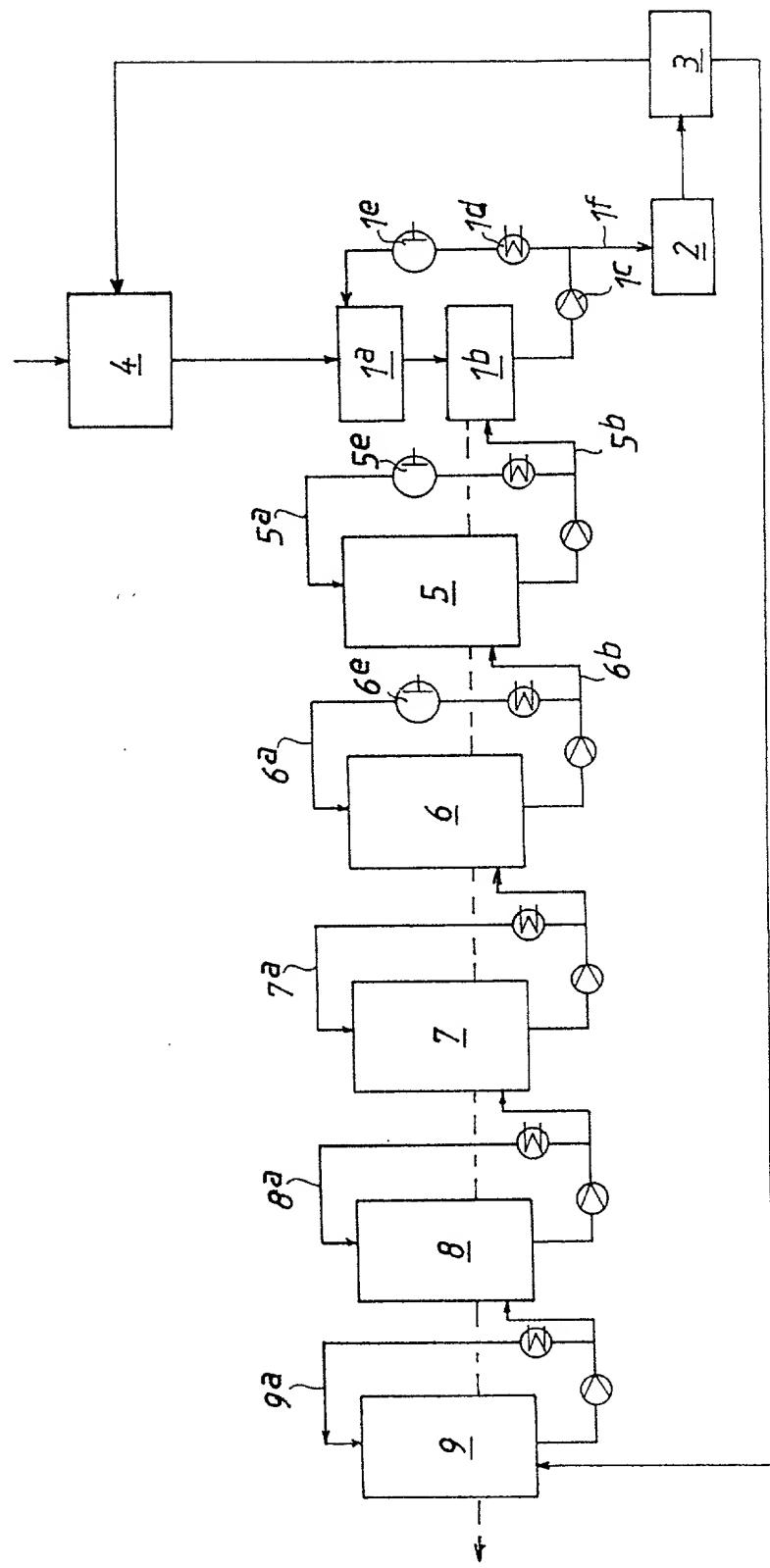
to $> 10^6$ /ml was already found after 5 days inspite of a careful cleaning and disinfection.

Patent Claims

1. Process for producing formed cellulosic articles, such as fibres, filaments, sheetings, membranes or tubes, comprising
 - a) extruding a solution of cellulose in an aqueous amine oxide, particularly N-methylmorpholine N-oxide, through an extrusion die via an air gap and coagulating the formed article in an aqueous precipitation bath containing amine oxide, and
 - b) passing the formed article through at least one washing stage for removing residual amine oxide,
characterized in that the liquor of the precipitation bath in the precipitation stage and/or the washing liquor of the washing stage(s) is treated with ultra-violet radiation.
2. Process according to claim 1 characterized in that an ultra-violet radiation having a wave length in the range from 200 to 280 nm is used.
3. Process according to claim 2 characterized in that the ultra-violet radiation has a wave length of 254 nm.
4. Process according to any of the claims 1 to 3 characterized in that the ultra-violet radiation is generated by a mercury low-pressure lamp.
5. Process according to any of the claims 1 to 4 characterized in that the UV treatment is limited to the liquors of the washing stage(s) having a temperature below 50°C.
6. Process according to any of the claims 1 to 5 characterized in that precipitation bath liquors or washing liquors having a Hazen color number Hz ≤ 400 is subjected to the UV treatment.

7. Process according to any of the claims 1 to 6 in which the precipitation bath and several washing stages are connected in series and have liquor cycles of their own, characterized in that the cycle liquors of the precipitation bath and the first washing stage(s) are treated with ultra-violet radiation.
8. Process according to claim 6 characterized in that the cycle liquors are irradiated with a power in the range from 0.1 to 1.0 Wh/l.

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ATTORNEY DOCKET NO. 4197-103

DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence/post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD FOR PRODUCING CELLULOSIC FORMS

the specification of which is attached hereto unless the following box is checked:

(X) was filed March 14, 2001 as US Application Serial No. 09/787,310 or PCT International Application

Number _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above. I acknowledge the duty to disclose all information which is material to patentability as defined in 37 CFR 1.56.

Foreign Application(s) and/or Claim of Foreign Priority

I hereby claim foreign priority benefits under Title 35, United States Code Section 119(a-d) or 365(b) of any foreign application(s) for patent or inventor(s) certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor(s) certificate having a filing date before that of the application on which priority is claimed:

COUNTRY	APPLICATION NUMBER	DATE FILED	PRIORITY CLAIMED UNDER 35 U.S.C. 119
Germany	198 42 556.2	September 17, 1998	YES: <input checked="" type="checkbox"/> NO: _____
PCT	PCT/DE99/02976	September 14, 1999	YES: <input checked="" type="checkbox"/> NO: _____

Provisional Application

I hereby claim the benefit under Title 35, United States Code Section 119(e) of any United States provisional application(s) listed below:

U.S. Priority Claim

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NUMBER	FILING DATE	STATUS(patented/pending/abandoned)
_____	_____	_____
_____	_____	_____
_____	_____	_____

POWER OF ATTORNEY:

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) listed below to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Steven J. Hultquist, Reg. No. 28021

Marianne Fuierer, Reg. No. 39983

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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X 29.06.01

Inventor's Signature

Date

ALC3/US

**DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION (continued)**

ATTORNEY DOCKET NO. 4197-103

2-00 Full Name of Inventor: Michael Mooz Citizenship: German
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X Mooz X 23.7.01
Inventor's Signature Date

Full Name of Inventor: _____ Citizenship: _____
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Inventor's Signature _____ Date _____

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